ATTACHMENT 11-1

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

CISCO SYSTEMS, INC.,
Plaintiff,
vs.
ARISTA NETWORKS, INC.,
Defendant.

Case No.
5:14-cv-05344-BLF (PSG)

*** HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY ***

VIDEOTAPED DEPOSITION OF RAMANATHAN KAVASSERI
Palo Alto, California
Tuesday, February 23, 2016
Volume I

Reported by:
CARLA SOARES
CSR No. 5908
Job No. 2216982
Pages 1 - 195

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

CISCO SYSTEMS, INC.,)
)
Plaintiff,)
) Case No.
vs.) 5:14-cv-05344-BLF (PSG)
)
ARISTA NETWORKS, INC.,)
)
Defendant.)
_____)

VIDEOTAPED DEPOSITION OF RAMANATHAN KAVASSERI, Volume I, taken on behalf of Defendant, at 601 California Avenue, Palo Alto, California, beginning at 10:09 a.m., and ending at 4:26 p.m., on Tuesday, February 23, 2016, before CARLA SOARES, Certified Shorthand Reporter No. 5908.

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Palo Alto, California 09:21:40

Tuesday, February 23, 2016

10:09 a.m.

P R O C E E D I N G S 09:21:40

THE VIDEO OPERATOR: Good morning. We are on the record at 10:09 a.m. on February 23rd, 2016. This is the videotaped deposition of Mr. Ramanathan Kavasseri.

My name is Ramon Peraza, here with our court reporter, Carla Soares. We're here from Veritext Legal Solutions at the request of counsel for the defendant. 10:09:15

This deposition is being held at Wilson Sonsini in Palo Alto. The caption of this case is Cisco Systems, Inc., versus Arista Networks, Inc., Case No. 5:14-cv-05344-BLF (PSG). 10:09:26

Please note that audio- and video-recording will take place unless all parties have agreed to go off the record. Microphones are sensitive and may pick up whispers or private conversations. 10:09:50

At this time, Counsel, please identify yourselves for the record and state whom you represent. 10:10:00

Q Sure. 11:37:17
The functional specifications that you reviewed when developing SNMP features, would that specification have been written by someone at Cisco?
A Yes. 11:37:27
Q And did you -- were you involved in writing any functional specifications?
A Yes, I was.
Q Was that for the features that you were implementing? 11:37:36
A Yes, it was. Yes, it was.
Q Do you recall right now which functional specifications you may have written?
A Not off the top of my head, no.
Q Did the GEM methodology involve reviewing 11:37:57 IETF documents?
A As far as I recall, no.
Q Did you review IETF documents when you were implementing SNMP features?
A That is a broad question. If the feature 11:38:12 had anything specific to do with an IETF document, then yes, I would have had to review the document to make sure I was implementing it correctly, "it" being whatever I was working on.
Q Okay. And that is something -- you would 11:38:26

have reviewed an IETF document relating to a feature 11:38:31 you were implementing before you implemented the feature; is that right?
A If there was an IETF document associated with what I was working on and I was required to 11:38:41 implement part or the whole part of that IETF document, then yes, I would have reviewed that IETF document before I implemented the feature.
Q Were there features that you developed at Cisco relating to SNMP that were not defined by an 11:38:56 IETF document?
A I don't have specifics, but I think that's a fair generalization, that there are parts of our -- the Cisco SNMP implementation that were not described in any part of any IETF document because 11:39:32 it was internal to how our product worked at the time.
Q So -- okay. When you were developing features related to SNMP at Cisco, did you also review what other vendors were doing? 11:40:04
MR. TUNG: Objection. Vague.
THE WITNESS: I do not recall.
BY MR. SANTACANA:
Q You don't recall either way?
A I would like to change my answer to, I 11:40:23

don't recall the features that I was working on, so 11:40:26 I don't recall specifically what I would have done to compare.
Q I see.
Was it part of your process in developing 11:40:35 features to review what other vendors were doing to implement the same features?
A Other -- so in the space that we worked with SNMP, vendors contributed to the IETF document so it wasn't as necessary to look at their 11:40:59 implementations because they were there telling us what they were trying to build. That was the whole point of building an industry standard.
Also, Cisco was on the leading edge of implementing the protocols as they were being 11:41:11 developed. In a few cases, we would have the implementations before the protocols were released because we were helping author the protocol.
So at that point, looking at other vendors was not possible because they had not done the 11:41:24 implementations or released the implementations, which is why I was being very specific in saying, I don't recall the exact features I was working on.
But my answer would change depending on what I was working on and depending on whether 11:41:37

somebody had done something in the field. 11:41:40
Q I understand.
Who else worked on the team that was implementing SNMP features at Cisco?
A I don't remember all the names, but my 11:41:58 manager was John Hopprich. My technical lead and mentor, Jeff -- Jeffrey Johnson. I had it for a moment and it went away there. Sandra Durham was one of my peers.
Anke Dosedal was also one of my team 11:42:34 members. Robert Stewart, who went by the moniker Bob, Bob Stewart, was also one of my peers.
Hold on. There's one more. Scott Mordock, M-O-R-D-O-C-K. Now, I can't recall if Scott was on the team when I joined or joined later. 11:43:03 He was I think at Cisco when I joined, but I'm not sure at what point he was part of the SNMP team or not. Long time ago.
So those are the names that come to mind.
Q What was John Hopprich's role on the team? 11:43:23
A He was my manager.
Q And were the rest of the names, apart from John Hopprich and Jeff Johnson, were they also software engineers?
A Yes. 11:43:36

Q If you take a look at the last command in this table, "snmp-server user," do you know whether you authored that command? 14:41:36
A Define what you mean by "authored that command." 14:41:55
Q Do you know whether you are the one who came up with the sequence of words that resulted in this command, "snmp-server user"?
A I cannot be definitive about it.
Q Who else do you recall working with on this project that resulted in these eight commands? 14:42:07
A I would probably have reviewed this with my team members. And so I can't -- the reason I answered the way I did is, I don't know if I came up with the word "user" or somebody else came up with the word "user." So I'm not sure in hindsight. 14:42:25
Q Did you come up with the term "snmp-server"?
A Absolutely not.
Q Okay. How do you know that? 14:42:39
A It was there before I joined.
Q It was where?
A It was in the IOS CLI before I joined Cisco.
Q Okay. And so the addition to that term 14:42:48

that was new was the word "user"? 14:42:52
A Yes.
Q Okay. And do you know where that word came from?
A The SNMP V3 protocol specification has a definition of roles, if I remember right, and users and groups are in the protocol. 14:43:00
Q So the term "user" came from the protocol -- came from the industry standard protocol? 14:43:21
A Yes.
MR. TUNG: Objection. Mischaracterizes.
THE WITNESS: It referred to what was in the protocol, yes.
BY MR. SANTACANA: 14:43:29
Q And the protocol uses the word "user"?
A I've got to go read the protocol to be absolutely sure.
Q Okay.
A After this, can we take a break? 14:43:51
Q Of course.
If you want, we can take a break right now.
A Fantastic.
THE VIDEO OPERATOR: We are off the record at 2:44 p.m. 14:44:01

(Recess, 2:44 p.m. - 3:05 p.m.) 14:44:02
THE VIDEO OPERATOR: We are back on the record at 3:05 p.m.
BY MR. SANTACANA: 15:05:39
Q Mr. Kavasseri, we left off talking about the "snmp-server user" command, and you testified that "snmp-server" came from a prior command in IOS at the time?
A No, I said that I don't know how it came about. It was already there when I joined Cisco. 15:05:56
Q And its inclusion in this command for which you are named the author, it's included there because it was already part of IOS?
A It was a root part of the command to which I added extensions. 15:06:12
Q And the root was in IOS before you started working at Cisco?
A To the best of my knowledge, it was already there before I started. 15:06:23
Q And the term "user" is a term that comes from the SNMP industry standard?
A I'm not sure I'd say it exactly that way. The term "user" relates to parts of the SNMP V3 protocol, yes. 15:06:48

Q Is that a term that the protocol uses? 15:06:49
A I believe so, but I -- if you have a copy of the reference, I could take a look.
Q Sure. Of course.
THE VIDEO OPERATOR: Exhibit 334. 15:07:03
(Exhibit 334 was marked for identification and is attached hereto.)
BY MR. SANTACANA:
Q Exhibit 334 is RFC 2274 titled "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMP V3)." 15:07:17
Do you know, sir, if this is an RFC that you reviewed when you were --
A Yes. Let me -- I'm pretty sure this was an RFC I reviewed because I ended up implementing parts of it. 15:07:39
Q And just to be clear, it's an RFC that you reviewed when you were implementing the eight commands in Exhibit 329?
A Seven. I'm not sure about "snmp host." 15:07:53
Q Okay. So this is something you would have reviewed before you proposed those command names?
A Yes, that's correct.
Q And does this document use the term "user" in the same way that the "snmp-server user" command 15:08:13

uses it? 15:08:17
A I would have to read it. Give me a minute to --
Can you rephrase or repeat the question, please? 15:09:11
Q This RFC 2274, does this document use the term "user" the same way that you used the term "user" in "snmp-server user"?
A The document does not define a CLI command or -- so I will -- the term "user" seems to refer to 15:09:39 the same entity in both cases. But the document does not tell me there needs to be a command called "snmp-server user."
Q I understand.
A Okay. 15:10:09
Q So you did not come up with the term "user"?
A In which context?
Q In the context of this "snmp-server user" command. 15:10:32
A As I responded earlier, I'm not sure how the term "user" came about, whether it was due to a group interaction or something I did or something somebody else did.
Q Okay. I'd like to direct your attention 15:10:50

Q Is this a document you reviewed when you 15:12:26 were preparing to implement the commands in Exhibit 329?
A I believe it would have been something I reviewed before I implemented the commands. 15:12:35
Q And if you flip to page 3 of the document, under Section 2.1 titled "Groups," the first paragraph defines the term "group" as follows: "A group is a set of zero or more securityModel, securityName tuples on whose behalf SNMP management 15:12:55 objects can be accessed. A group defines the access rights afforded to all securityNames which belong to that group."
Does this RFC use the term "group" the same way that you were using it in your "snmp-server 15:13:08 group" command?
A I believe so.
Q What does the "snmp-server group" command do?
A Actually, even reading this document 15:13:26 probably won't tell me because I need to see all the help extensions to see what it does.
Q Okay.
A So it's been a while.
Q You don't recall what it does? 15:13:34

now to "snmp-server group," which is the next row 15:10:53 up.
A Yeah.
Q As you've testified, "snmp-server" was a term that was a root already present in IOS at this 15:11:03 time; is that correct?
A Yes.
Q The term "group," did that come from IOS as well or did it come from somewhere else?
A I believe there was a concept of "group" 15:11:20 in this document. Let me look through it one more time.
Q I think you'll have more luck with this one.
A Yeah, there may be a separate document for 15:11:48 that.
(Exhibit 335 was marked for identification and is attached hereto.)
BY MR. SANTACANA:
Q Exhibit 335 is RFC 2275 entitled 15:12:02 "View-based Access Control Models (VACM) for the Simple Network Management Protocol (SNMP)." It's dated January 1998.
Do you recognize this document, sir?
A Yes, I do. 15:12:25

A No. 15:13:35
Q Okay. Do you recall what "snmp-server user" does?
A I would rather not guess at this point. It's been years since I used these commands. 15:13:45 I probably would be able to figure it out within about 25 minutes of touching the CLI, but it's really old, old stuff.
Q I understand.
I'd like to turn your attention now to the 15:14:14 two commands right above that, "snmp-server engineID local" and "snmp-server engineID remote."
Did you author those commands?
A I think I have a strong recollection that I had more to do with these commands; in part, the 15:14:32 fact that there was the ID which is upper case, which is usually not what we do in these IOS CLI commands. It stands out.
Q Typically in IOS CLI you weren't accustomed to seeing letters capitalized like they 15:14:52 are in the term "engineID"?
A Yes.
Q Why were they capitalized here?
A I have no idea why I capitalized them.
Q Okay. 15:15:07

rest of the configuration through SNMP directly. 15:31:32
This was not possible before.
Because it was not possible before, we had never bothered with creating communities which existed before SNMP V3 through SNMP. So now we 15:31:46
needed to add that as a support feature as well.
BY MR. SANTACANA:
Q And the reason you needed to add the ability to create and delete communities, users and groups was because of the features of the industry 15:31:59
standard SNMP V3?
A I don't know whether SNMP V3 -- the SNMP V3 talked about users, not communities, if I remember right. I think that's what we referred to in the -- in getting -- things getting tricky. 15:32:24
Even now we just had it through SNMP, so only the IOS CLI was the point of record. I'm not sure whether I meant here that you could delete stuff through SNMP that was created through the CLI and now the CLI needs to be regenerated or resaved 15:32:38
to NV RAM.
Q Okay. I think I understand. And it might be clear if you flip to the page that ends in 75, Section 2.7.
Section 2.7 says, "SNMP V1/V2 versus SNMP 15:33:02

V3 -- differences, and how things work." 15:33:07
And then you have a list of differences and how things work between the old and the new versions of SNMP.
The first thing that you wrote was, "In 15:33:18
SNMP V3, 'community strings' are called 'users,'" and "users" is in quotation marks. "Each 'user,'" in quotation marks again, "has an access-policy, which is termed a 'group,'" and the word "group" is also in quotation marks, "i.e., users belong to a 15:33:31
group."
A Yep.
Q Does this -- strike that.
Does this refresh your recollection as to whether the terms "users" and "group" came from the 15:33:49
SNMP standard?
A The term "user" and "group" referred to concepts in the SNMP standard. Of that, I have no issue with saying that.
The reason I hesitate is, we use the term 15:34:19
"user," and we could have used VACM user or any other combination of "user."
We settled on "user." I'm not sure that that was because it was directly due to looking at the RFC, or somebody in parser police or within my 15:34:35

team suggested, "Hey, go with the shortest string." 15:34:39
Because when you're talking about the command line, it's all about how many characters you type, or it's a lot to do with how many characters you type. 15:34:51
Q Why is that?
A Well, you could type U and hit "tab," and if there was no other word that started with U, IOS would auto-complete to "user." So you didn't need to type the whole thing. 15:35:03
Q Okay. If you turn to the page that ends in 82, this is the end of a list of CLI commands that you're proposing, and this one in particular is the "snmp-server engineID" command.
Do you see that? 15:35:28
A Can you repeat that again, please?
Just -- I'm slowing down reading stuff already.
Q Of course. After the first paragraph here, which carries over from the previous page, there's an asterisk, and then there's the 15:35:40
"snmp-server engineID" command.
A Yeah.
Q And then below that you describe what the command is and what it's going to do.
Do you see that? 15:35:49

A Yeah. 15:35:51
Q And then also it shows that local and remote are optional arguments.
Do you see that?
A Where does it say local and remote are 15:36:03
optional arguments?
Q Directly under "snmp-server engineID," do you see the open bracket, and then it says, "local," and then there's a vertical line, and then it says, "remote"? 15:36:13
A So --
Q So it indicates that the command "snmp-server engineID" could either take the local argument or the -- parameter, if you will, or the remote. 15:36:27
A No, I don't think that this is an optional argument. I think there's a typo in this text here.
Q Okay.
A Because if you look at it, the first bracket is an open curly brace. There is no close 15:36:34
curly brace.
I assume that -- and again, I could be completely wrong on this. I assume that the -- if you look at "remote ipaddress udp-port," and then within angle brackets, "port," following that are 15:36:52

standard protocol while you were working at Cisco? 15:42:40
A I was not in the room for discussions to -- let me rephrase by saying I had very limited interactions at the time this document was written.
I know that Jeffrey Johnson was very 15:43:08 involved because he was my mentor, and he would tell me that he was working on the RFC draft. I have no direct evidence of the other two that I can recall.
I will add an addendum that they both were very respected people, and I'm very sure they did a 15:43:32 lot for these documents. I just don't have any direct evidence that I was privy to from a working meeting or anything else.
Q Okay. So you can set that aside now.
Looking back at Exhibit 329, we'd started 15:43:57 discussing the four "show" commands, "show snmp" commands.
"Show" was a term that was already in IOS CLI; is that fair to say?
A When I joined Cisco -- I've actually never 15:44:11 asked the question when "show" was in the command. As far as I can tell, it was there when I joined.
Q And the reason that you used it here was because it was already used in other IOS CLI commands? 15:44:37

Q I understand. 15:45:53
You've expressed some additional haziness about the command "show snmp host."
A Yes.
Q I'm going to apologize in advance for the 15:46:21 heft of this thing.
A Holy cow.
(Exhibit 338 was marked for identification and is attached hereto.)
BY MR. SANTACANA: 15:46:31
Q Exhibit 338 is titled "Cisco IOS Network Management Command Reference." It bears control numbers beginning with CSI-CLI-00319765, and it's dated October 2009.
I just want you to flip to the page that 15:47:03 ends in 1060. The internal page would be NM-1248.
So this page relates to the command "snmp-server host."
A Yes.
Q Do you recognize that command? 15:47:58
A Yes, now I do.
Q Did you author that command?
A I will go back to my earlier statement that it's highly likely that I checked in the file with this command. Especially with this command, I 15:48:21

A By the time I implemented these commands, 15:44:38 "show" was the standard way to display information from the CLI.
Q And the term "SNMP," of course, as we've discussed, is an industry standard protocol; is that 15:44:49 fair to say?
A In which context? The term "SNMP" by itself as an acronym is industry standard protocol, yes.
Q And then so the first two words in each of 15:45:07 these commands is "show snmp." And then we have "show snmp user" and "show snmp group."
A Yeah.
Q And the terms "user" and "group" also are terms that are used in the IETF SNMP documents; is 15:45:21 that fair to say?
A "User" and "group" appear in the -- "snmp user" and "group" appear in the IETF documents.
Q And the way that they're used here is the same way that they're used in those IETF documents? 15:45:35
A To the best of my knowledge, they refer to the same things. But they're not used in the same way in that the IETF document does not refer to a CLI command. In here they're used specifically for CLI commands. 15:45:52

am not sure whether I was the original author of the 15:48:24 term "host."
I'm going to say "term" instead of "command," which you used, because we're talking about an extension to the SNMP server command here. 15:48:32
The reason I say "host" is, if I remember right, the previous version, now that I'm reading this, we are specifying the target of an event that is being messaged through SNMP.
Previously this event was called a trap. 15:48:58 Now we're giving you the option of a trap or an inform.
So there was some effort to differentiate between what was before and what is now the acceptable -- accepted way of configuring targets. 15:49:20
Q If you look at the page NM-1251, control number ends in 1063, this is a command history for the command "snmp-server host," and it lists as the first release IOS version 10.
Do you see that? 15:50:04
A "Host"? I thought that that previous version was "enable trap." Let me double-check. Yeah, this differs from my recollection.
Q Sorry?
A This differs from my recollection. 15:50:29

I, RAMANATHAN KAVASSERI, do hereby declare under penalty of perjury that I have read the foregoing transcript; that I have made any corrections as appear noted, in ink, initialed by me, or attached hereto; that my testimony as contained herein, as corrected, is true and correct.

EXECUTED this _____ day of _____, 2016, at _____, _____.
(City) (State)

_____
RAMANATHAN KAVASSERI

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were administered an oath; that a record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; that the foregoing transcript is a true record of the testimony given.

Further, that if the foregoing pertains to the original transcript of a deposition in a Federal Case, before completion of the proceedings, review of the transcript [X] was [ ] was not requested.

I further certify I am neither financially interested in the action nor a relative or employee of any attorney or any party to this action.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: 3/7/16

Carla Soares
CARLA SOARES
CSR No. 5908

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

CISCO SYSTEMS, INC., Plaintiff, vs. ARISTA NETWORKS, INC., Defendant.) No. 5:14-cv-05344-BlF (PSG)

CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

VIDEOTAPED DEPOSITION OF ANTHONY J. LI

Palo Alto, CA

Monday, February 1, 2016

Volume I

Reported by: SUSAN F. MAGEE, RPR, CCRR, CLR

CSR No. 11661

JOB No. 2224600

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

CISCO SYSTEMS, INC., Plaintiff, vs. ARISTA NETWORKS, INC., Defendant.) No. 5:14-cv-05344-BlF (PSG)

CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER VIDEO DEPOSITION OF ANTHONY J. LI taken on behalf of Defendant at WILSON, SONSINI, GOODRICH & ROSATI, 601 South California Avenue, Palo Alto, CA 94304, beginning at 9:13 a.m. and ending at 4:17 p.m. on Monday, February 1, 2016, before Susan F. Magee, RPR, CCRR, CLR, Certified Shorthand Reporter No. 11661.

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EXHIBITS

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E X H I B I T S (continued)

Palo Alto, CA, Monday February 1, 2016
9:13 a.m.

THE VIDEOGRAPHER: Good morning. We're on the record at 9:13 a.m. on February 1st, 2016. This is the video recorded deposition of -- so sorry. Of Anthony Li here with our court reporter Susan Magee. 09:13:47

My name is Jefree Anderson. We are here from Veritext Legal Solutions at the request of counsel for the -- defendant or the plaintiff? 09:14:16

MR. WONG: Defendants.

THE VIDEOGRAPHER: For the defendant. This deposition is being held at Wilson Sonsini at 601 California Avenue, Palo Alto, California. The caption of this case is Cisco Systems, Incorporated vs. Arista Networks, Incorporated. The case number is 5:14-cv-05344. 09:14:31

Please note that audio and video recording will take place unless all parties agree to go off the record, and microphones are sensitive and may pick up whispers, private conversations and cellular interference; so please be aware of that. 09:14:53

Beginning with our noticing attorney, please state your name and the firm you represent.

MR. WONG: Ryan Wong from Keker & Van Nest 09:15:05

for defendant Arista Networks.

MR. FERRALL: Brian Ferrall, Keker & Van Nest, also for Arista.

MR. PAK: Sean Pak of Quinn for Cisco.

THE VIDEOGRAPHER: Thank you. 09:15:16

Will the court reporter please swear in the witness.

ANTHONY J. LI,

having been administered an oath, was examined and testified as follows: 09:15:19

EXAMINATION BY MR. WONG

Q. Good morning, Mr. Li. 09:15:29

A. Good morning.

Q. Please state your full name.

A. Anthony Joseph Li.

Q. Do you live in the Bay Area, Mr. Li?

A. I do. 09:15:36

Q. Please state your home address.

A. 1218 Thurston Avenue, Los Altos, California 94024.

Q. Mr. Li, do you understand that are you testifying here in response to a subpoena in this 09:15:46

DEC systems, also had several IBM systems. VMCMS is an operating system for IBM mainframes, and USC had one and I had an account on the VM system.
Q. And what was the command syntax like for the CLI on VMCMS? 09:45:55
A. I'm sorry. I don't remember.
Q. You mentioned RSX-IIM?
A. It's 11M.
Q. 11M. Sorry.
A. This was an operating system for PDP-11s. 09:46:06
Q. What are PDP-11s?
A. That was a computer built by Digital Equipment Corporation.
Q. Do you recall the command syntax of the command line interface used on the RSX-11M? 09:46:25
A. No, I'm sorry. I don't.
Q. You mentioned that the LinkedIn profile that we marked as Exhibit 136 did not have your full work history?
A. Correct. 09:46:46
Q. What work history is missing from your LinkedIn profile?
A. In particular the sys admin positions that I mentioned, summer internships predating. There were several of those. Full-time positions that are 09:46:59

not relevant to my professional experience, particularly while I was in high school.
Q. Sure. After you graduated from USC, what did you do then?
A. So I -- next fall I went to Rutgers and 09:47:20 spent a year there, hated it and immediately transferred to USC.
Q. Oh, I'm sorry. My question was after you graduated from USC, what did you do after that?
A. After USC? So I graduated in September 09:47:38 of 1990. I worked on a postdoc at USC with Deborah Estrin and then took a position at Cisco Systems.
Q. Do you know when you started at Cisco Systems? 09:47:53
A. January 14th, 1991.
Q. Why did you join Cisco after graduating from USC?
A. Lack of a better job.
Q. Did you apply elsewhere besides Cisco? 09:48:02
A. I did.
Q. And describe for me the projects that you worked on while you worked at Cisco starting in 1991.
A. I worked on a wide, wide variety of 09:48:22

projects throughout the router. I started off doing mostly maintenance work and answering customer questions. I then had several development projects. My first development project was implementing something called TCP header compression. 09:48:41
Q. And after you worked on TCP header compression, what else did you work on while at Cisco?
A. I had numerous routing -- small projects within routing extending various interfaces and 09:48:58 extending protocols as necessary.
My next big project was actually working on BGP, Border Gateway Protocol.
BY MR. WONG: Q. You mentioned TCP header expression. What does TCP mean? 09:49:22
A. That's Transmission Control Protocol. It's part of the Internet Protocol suite.
Q. Is TCP an industry standard?
A. It is.
Q. Was it an industry standard at the time you 09:49:37 worked on it at Cisco?
A. It was.
Q. What standard-setting body produced the TCP standard?
A. That's a difficult question. The TCP 09:49:49

standard was really a product of -- I guess the ARPANET project, but this actually predates IETF being accepted as a standards-making body, which is a whole book in itself. Great deal of politics behind that. So it was a de facto standard 09:50:16 effectively.
Q. What do you mean by "de facto standard"?
A. Which meant that the industry used it and it was publicly available, everyone was free to adopt it, and yet it did not have the backing of a 09:50:36 formal standards body such as the IEEE.
MR. PAK: I'll object to this line of questioning as calling for expert testimony.
BY MR. WONG: Q. Now, you said that the TCP standard was really a product of ARPANET; 09:51:10 correct?
A. Correct.
Q. What is ARPANET?
A. ARPANET was a project from the Defense Department's Advanced Research Projects Agency to 09:51:18 build a network for computers that was highly robust and relayed data between computers efficiently.
Q. How do you know that, Mr. Li?
A. Having worked on it for many, many years and been involved with it as soon as it became 09:51:34

with during this 1991 through 1996 time period at Cisco?
A. Everything else in the IP protocol suite within Cisco. This includes RIP, IGRP, EIGRP, EGP, OSPF, IS-IS. I also had my hands in some of the CLNS stack. 10:03:14
Q. What is OSPF?
A. Open Shortest Path First routing protocol from the IETF.
THE REPORTER: Would you mind repeating that. I'm sorry. 10:03:43
THE WITNESS: Open Shortest Path First routing protocol from the IETF.
THE REPORTER: Thank you.
BY MR. WONG: Q. And the RIP and the IGRP you just mentioned, those are the same RIP and IGRP you were discussing earlier today; correct? 10:03:51
A. Yes.
Q. You mentioned IS-IS.
What is IS-IS? 10:04:00
A. This is another routing protocol that comes from the ISO protocol stack and the OSI standards body. It supports routing for both CLNP and IP.
Q. What is CLNP?
A. Connectionless Network Protocol. 10:04:25

Q. And is that protocol also an industry standard?
A. It is.
Q. What is the standard-setting body that manages CLNP? 10:04:37
A. ISO.
Q. What is ISO?
A. International Standards Organization. Although that's more formally it's -- the official name is in French, so . . . 10:04:53
Q. When you were talking about IS-IS, you mentioned the OSI standards body.
Do you remember that?
A. That's correct.
Q. What is the OSI standards body? 10:05:04
A. Open systems -- I don't remember the full expansion. Sorry.
Q. Okay. So who was the standard-setting body for IS-IS?
A. I believe that was -- falls under ISO which is the child of OSI. 10:05:20
Q. And how do you know that, Mr. Li?
A. I've read the document.
Q. When you say "the document," do you mean the -- 10:05:34

A. The standard -- the standard for IS-IS.
MR. PAK: Ryan, when you get a chance, can we take a break? We've been going for about an hour.
MR. WONG: Sure. We can take a break now. 10:05:45
THE WITNESS: Thank you.
THE VIDEOGRAPHER: Going off the record. The time is 10:05.
(Recess taken from 10:05 a.m. to 10:11 a.m.) 10:11:25
THE VIDEOGRAPHER: We're back on the record. The time is 10:11.
BY MR. WONG: Q. Mr. Li, you used the acronym BGP to refer to the Border Gateway Protocol; correct? 10:11:46
A. Correct.
Q. Is BGP a commonly known acronym for Border Gateway Protocol?
A. No, not common.
Q. Okay. Is it a -- strike that. 10:11:54
Why do you use the term "BGP" to refer to the Border Gateway Protocol?
A. So that's the acronym that is used within the industry.
Q. When you say that's the acronym that's used 10:12:10

within the industry, you're referring to the BGP acronym; correct?
A. Correct.
Q. And when you say "the industry," what do you mean by "the industry"? 10:12:21
A. Computer network.
Q. And how long as BGP been used as an acronym within the computer networking industry, to your knowledge?
A. Since BGP was first introduced, which I believe was approximately 1989. 10:12:42
Q. Okay. And why do you use the term "RIP" or R-I-P to refer to Router Information Protocol?
A. That is the common acronym used for that protocol. 10:13:21
Q. In the networking industry?
A. In the networking industry.
Q. And how long has RIP been a commonly used acronym in the networking industry?
A. I don't know. 10:13:30
MR. PAK: Objection. Calls for expert testimony.
BY MR. WONG: Q. Okay. But to your knowledge, it is a commonly used acronym in the networking industry today? 10:13:39

A. It is.
Q. Do you know when you first started using the acronym RIP?
A. 1991 when I came to Cisco.
Q. And did you come up with the acronym RIP? 10:13:48
A. No, I did not.
Q. Where did you get that acronym from?
A. I heard it from coworkers first.
Q. And you did not come with the acronym BGP; correct? 10:14:07
A. Correct.
Q. Where did you first hear the acronym BGP?
A. From discussions on a Usenet mailing list.
Q. What is a Usenet mailing list?
A. Usenet was a system for exchanging 10:14:23 messaging in a broadcast fashion, and there were groups within that where people would circulate messages. And so there was a discussion of routing protocols, and I heard about it first through that.
Q. And what time period are you talking about 10:14:45 here when you first heard the acronym BGP?
A. This would be somewhere between about 1985 to 1990.
Q. So that was before you started working at Cisco; correct? 10:15:01

working for Cisco in 1991?
A. Approximately three.
Q. What was your familiarity with the command line interface on Cisco's routers before you started working at Cisco in 1991? 10:16:30
A. So I used Cisco's CLI for those three years between '87 and 1991.
Q. What level of familiarity -- strike that.
Was OSPF a well-known acronym in the networking industry? Actually, strike that. 10:17:02
Is OSPF a well-known acronym in the networking industry?
A. Yes, it is very well-known.
Q. And when did you first hear of the acronym OSPF, Mr. Li? 10:17:12
A. As part of my employment at Cisco.
Q. Approximately when did you hear -- first hear of OSPF?
A. About 1992.
Q. Approximately how long has "OSPF" been a 10:17:23 well-known term in the networking industry, to your knowledge?
MR. PAK: Objection. Calls for expert testimony.
THE WITNESS: I suspect at least 1989. 10:17:32

A. Correct.
Q. Is "IGRP" also a commonly used term in the networking industry?
A. It is.
Q. And how long, to your knowledge, has "IGRP" 10:15:17 been a commonly used term in the networking industry?
MR. PAK: Objection. Calls for expert testimony.
THE WITNESS: I recall seeing it very early 10:15:24 on. I first learned about it in 1987.
BY MR. WONG: Q. And you did not come up with the acronym IGRP; right?
A. No, I did not.
Q. Do you recall how you first learned about 10:15:38 the acronym IGRP?
A. So I was asked to administer a Cisco router in 1987 and was -- did Cisco training and learned about IGRP through that training.
Q. And that was before you joined Cisco in 10:15:58 1991; right?
A. That's correct. I was a customer before an employee.
Q. How many years of experience did you have working with Cisco routers before you started 10:16:15

BY MR. WONG: Q. Why do you say that, Mr. Li?
A. So there's work started on OSPF early on prior to my joining Cisco and prior to my learning about it, and I believe that was about '89. 10:17:44
Q. When you say there was work started on OSPF, what are you referring to by that?
A. This is work in the IETF to specify the protocol.
Q. And how did you know that there was work 10:18:02 started on OSPF by the IETF around 1989?
A. So there was a discussion list about it, and I looked at some the history of OSPF and looked at the RFC that subsequently came out. I knew that folks had been working on it for quite some time. 10:18:33
Q. Who was participating in the discussion list about OSPF at that 1989 time period?
A. I --
MR. PAK: Objection. Calls for speculation. 10:18:48
THE WITNESS: So John Moy, Milo Medin, Vince Fuller, Cathy Wittbrodt. Don't remember the rest.
BY MR. WONG: Q. And how do you know those individuals you just named were part of the 10:19:12

discussion of OSPF in 1989?
A. I subsequently worked with them as part of IETF and learned of their involvement with OSPF.
Q. You worked -- strike that.
When did you work with those individuals as part of the IETF? 10:19:31
A. I started working with them in 1991.
Q. What companies, if you recall, did those individuals work for?
A. John Moy represented Proteon. Milo Medin worked for NASA. Cathy Wittbrodt was at Energy Sciences Network at -- as part of Lawrence Livermore Labs. 10:19:50
Q. Did any other vendors -- strike that.
Did any other companies or organizations besides the ones you just mentioned participate in OSPF standardization? 10:20:20
MR. PAK: Objection. Calls for speculation. Calls for expert testimony.
THE WITNESS: So I'm certain that several others did. The best way to check would be to look at the IETF attendance records. 10:20:32
BY MR. WONG: Q. When you say you're certain that several others did, why are you so certain? 10:20:43

A. The IETF typically has dozens of people operating, working together on any given protocol.
Q. And how do you -- how do you know that, Mr. Li?
A. So that's -- I started participating in the IETF in 1991, and that's their standard way of working. 10:20:57
Q. How many years have you been participating in the IETF since 1991?
A. I participated quite consistently up and through about -- from 1991 to about 1999, and then it's been sporadic since then. 10:21:15
Q. When you say the IETF typically has dozens of people working together on any given protocol, are those people from the same company or different companies? 10:21:42
MR. PAK: Objection. Calls for speculation. Vague.
THE WITNESS: Typically the group -- working groups that are working on a protocol draw people from all sorts of different companies and organizations. 10:21:54
BY MR. WONG: Q. Can you think of any protocols from the IETF where different organizations did not participate in creating the 10:22:12

standard?
A. Not offhand.
Q. Is IS-IS a well-known acronym in the networking industry?
A. Largely, no. 10:22:41
Q. How do you know the IS-IS acronym?
A. I'm part of a small group who've made use of the protocol.
Q. Is IS-IS a well-known acronym amongst those who make use of the IS-IS protocol? 10:23:01
A. Yes, it is.
Q. Why is it a smaller group that makes use of the IS-IS protocol?
A. So IS-IS is part of the ISO protocol stack which ended up not having a significant market share, and thus there's a very small user base. 10:23:15
Only a very small portion of the I net -- IP networking industry ended up using IS-IS, and so the number of people that use IS-IS for IP routing is very, very small. 10:23:38
Q. How long has IS-IS been a well-known acronym amongst those who make use of the IS-IS protocol, to your knowledge?
A. At least 1991.
Q. And when did -- when did you first hear of 10:23:50

the IS-IS acronym?
A. 1991 when I joined Cisco.
Q. Is "IP" a well-known industry term in the networking industry?
A. Very well. 10:24:07
Q. In your view, what other acronyms are as well-known as IP in the networking industry?
MR. PAK: Objection. Calls for expert testimony.
THE WITNESS: TCP, TCP/IP, WWW. 10:24:19
BY MR. WONG: Q. How long has IP been a well-known acronym in the networking industry?
A. At least since 1983.
Q. And when did you first learn of the acronym IP? 10:24:44
A. Approximately 1984 I took a class in computer networking and read the -- first read the RFCs on IP.
Q. Is BGP a -- let me start that again.
Is "BGP" a well-known term in the networking industry? 10:25:25
A. It is.
Q. How long has "BGP" been a well-known term in the networking industry?
MR. PAK: Objection. Calls for expert 10:25:34

testimony.
THE WITNESS: Probably since about 1993.
BY MR. WONG: Q. And why do you say that "BGP" has been a well-known term in the networking industry since 1993? 10:25:47
A. I'm an expert in BGP.
Q. Why do you say that you are an expert in BGP?
A. I helped deploy BGP throughout the Internet. 10:26:00
Q. What did you do to help deploy BGP throughout the Internet?
A. So I was responsible for maintaining and enhancing BGP. I was responsible for doing a great deal of bug fixing to BGP. And as part of that, I 10:26:17 ended up reimplementing much of Cisco's BGP code and replacing the vast majority of the code that they had.
Q. And when did you first hear of the acronym BGP? 10:26:43
A. Again, I believe it was in the late '80s as part of the Usenet group.
Q. Is "DNS" a well-known term in the networking industry?
A. It is. 10:27:07

Q. How long has "DNS" been a well-known term in the networking industry, Mr. Li?
A. At least since late '80s.
Q. When did you first learn of the term "DNS"?
A. I was a sys admin at USC at the time. 10:27:19
Could have been anywhere from '83 on.
Q. How do you know that "DNS" has been a well-known term in the networking industry since the late 1980s?
A. So I would helped convert USC from using 10:27:40 host.text, which was previous system, to using DNS.
Q. Is "DHCP" a well-known term in the networking industry?
A. It is.
Q. How long has "DHCP" been a well-known term 10:28:00 in the networking industry?
A. I don't know.
Q. When did you first hear of the acronym DHCP?
A. Probably 1991. 10:28:08
Q. Why do you think you first heard of DHCP in 1991?
A. I helped maintain DHCP relay functionality in Cisco IOS.
Q. What did that -- strike that. 10:28:21

What did that entail, maintaining DHCP relay functionality in Cisco IOS?
A. Means that I had to look at the source code, read the DHCP RFC, test the behavior of the Cisco DHCP relay and then repair the functionality 10:28:49 in the source code as necessary.
Q. At some point, Mr. Li, you left Cisco's employment; correct?
A. Several times.
Q. When you started at Cisco in 1991, when did 10:29:12 you leave?
A. I believe it was 1996.
Q. What did you do after you left Cisco in 1996?
A. After a while I joined Juniper Networks. 10:29:28
Q. And what was Juniper's business at the time?
A. Juniper was a startup in the computer networking space.
Q. What was Juniper's main product at the 10:29:41 time?
A. They had no product initially, and their first product was a router, the M40, and I believe that came out in 1998.
Q. Did you work on the M40 Juniper router? 10:29:59

A. I did.
Q. Now, you said Juniper had no product initially.
Did they have no product when you joined them in 1996? 10:30:16
A. That's correct. We were a startup. We had -- I was Employee No. 5. We had an office, and that was it.
Q. Who were Juniper's competitors?
A. At the time it was Cisco. I believe Pluris 10:30:30 came along shortly thereafter, but I don't know exactly when. There was another company called NetStar. Wellfleet. Proteon had not quite gone under.
That's all I can remember. 10:31:03
Q. Now, you said you were Employee No. 5; correct?
A. Correct.
Q. Where did the other first employees at Juniper come from? 10:31:15
A. So the founder Pradeep Sindhu was coming out of Xerox PARC and Sun. Bjorn Liencres I believe was Sun. Dennis Ferguson, I knew him through IETF, and he was at -- running CAnet, although I don't know who he was affiliated with. 10:31:36

Q. What was your involvement in -- strike that.
What is Exhibit 139?
A. It appears to be a copy of RFC 1887.
Q. What was your involvement in RFC 1887, 11:46:30
Mr. Li?
A. So Yakov and I coauthored or coedited this document in an attempt to document a routing protocol architecture -- a routing architecture for IPv6. 11:46:45
Q. What is IPv6?
A. That is the next version of the Internet Protocol. What a widely deployed right now today is known as IPv4. It has the problem that it does not have enough address space and can only support about 11:46:59
4 billion hosts.
IPv6 is a -- the next version that has been approved by the IETF and we're currently transitioning to IPv6, slowly.
Q. We're currently transitioning today, you 11:47:17
mean?
A. Yes. Twenty years and counting.
Q. And I'm sorry. What was the date on the document marked as Exhibit 138, Mr. Li?
A. That appears to be March 1995. 11:47:33

Q. Was this document -- strike that.
When was the first version of the document marked as 138 completed, to your knowledge?
A. I would have to check my notes to be precise but somewhere approximately 1994. 11:48:04
Q. Turning back to Exhibit 139, Mr. Li, what is the date on this document?
A. December 1995.
Q. Is that the publication date for this RFC?
A. Yes, it is. 11:48:19
Q. And was the document that is shown Exhibit 139, was that completed before the publication date shown on Exhibit 139?
A. Yes, it was.
Q. Do you know approximately when? 11:48:34
A. Somewhere between '93 and '94.
Q. Did you come up with the term "IPv6," Mr. Li?
A. No, I did not.
Q. Do you know who? 11:48:42
A. No. Can't be specific.
Q. Is IPv6 a well-known acronym in the networking industry?
A. Yes, it is. It is a well-known acronym for Internet Protocol version 6, and this -- this 11:48:53

acronym was designated by the IETF.
Q. What do you mean, "this acronym was designated by the IETF"?
A. So the IETF, in selecting this protocol to migrate to, decided that we should all refer to 11:49:10
version 6 of the protocol as IPv6.
Q. And how do you know that the IETF decided that we all should refer to version 6 of the IP protocol as IPv6?
A. I was there as part of the discussion. 11:49:27
Q. What vendors were part of that discussion?
A. I'm sorry. I don't recall.
Q. Were there more than one vendor part of that discussion?
A. Yes, many. 11:49:40
Q. Do you recall if Cisco was part of that discussion?
A. I believe so.
Q. Do you recall if Juniper was part of that discussion? 11:49:48
A. I believe so.
Q. Were there any other acronyms relating to routing protocols that the IETF decided should be used to refer to those protocols?
A. Yes, many. 11:50:05

Q. What protocols did the IETF decide that everyone in the network industry should use in addition to IPv6?
MR. PAK: Objection. Calls for expert testimony. 11:50:18
THE WITNESS: So OSPF, BGP, RSVP, LDP, HTTP.
BY MR. WONG: Q. Was "IS-IS" a -- a term -- strike that.
Did the IETF have any role in the decision 11:50:50
for IS-IS to be used by the networking industry?
A. Somewhat. Again, IS-IS was originally standardized outside of the IETF. The IETF had the responsibility of managing the usage of IS-IS for Internet Protocol routing. 11:51:14
Q. And to your knowledge, Mr. Li, based on your experience working in the industry, did various vendors use those acronyms that you just listed out for me?
A. Yes, frequently. 11:51:38
Q. To what extent was there any belief that these acronyms for routing protocols were proprietary to any single vendor?
MR. PAK: Objection. Calls for speculation. 11:51:58

THE WITNESS: So the acronyms were never proprietary.
BY MR. WONG: Q. And on what facts do you base that opinion, Mr. Li?
A. So the acronyms were never published with a trademark or copyright notice attached to them. 11:52:06
Q. Did you ever believe personally that the use of OSPF, BGP, IP or any of the other acronyms that we've been discussing today were proprietary to any vendor? 11:52:32
A. No.
Q. In your experience at multiple companies in the networking industry, did anybody else that you worked with express the belief to you that any of these acronyms were proprietary to any vendor? 11:52:48
A. No.
Q. So in the 25 years that you have been working in the networking industry, you have not heard anybody express the belief that any of these acronyms were proprietary to a single vendor? 11:53:08
A. That's correct.
Q. Turning back to Exhibit 139, Mr. Li, first page further down, second paragraph from the bottom, the word "domain" is used.
Do you see that? 11:53:23

A. Yes.
Q. Did you come up with the word "domain"?
A. No, I did not.
Q. Do you know who did?
A. I believe that was Dr. Rechter. 11:53:31
Q. Do you know when Dr. Rechter came up with the name "domain"?
A. I believe that he came up with that term during the work for IDRP, and that flowed -- and it is semantically equivalent to Autonomous System, and it flowed from his work in IDRP into both this document and the BGP specification. 11:53:49
Q. And how do you -- how do you know that, Mr. Li?
A. Direct work with both of those specifications. 11:53:58
Q. Okay. By the time of this RFC, December 1995, was "domain" a well-known industry term?
MR. PAK: Objection. Vague. 11:54:10
THE WITNESS: No, it was not well-known and still is not very well-known.
MR. WONG: Let's mark this one as 140, please.
(Exhibit 140 was marked for identification by the court reporter and is attached hereto.) 11:54:45

BY MR. WONG: Q. The court reporter has marked as Exhibit 140 a document bearing Control Nos. ARISTANDCA00025927 to -25933.
Mr. Li, have you seen this document before? 11:55:28
A. I believe so.
Q. What is the document marked as Exhibit 140?
A. It appears to be a copy of RFC 1966, BGP Route Reflection.
Q. Did you -- what was your involvement, if any, in the creation of the document marked as Exhibit 140? 11:55:45
A. So I helped discuss many of the concepts in this document. As part of the development and deployment of BGP, we found that we had numerous scalability issues that we needed to overcome. There were several approaches proposed. I helped work on the Route Reflection proposal. 11:56:02
Some of the original work was proposed by Dimitry Haskin of Bay Networks. And as part of the IDR working group, we jointly discussed and came up with this proposal. 11:56:20
Mr. Bates and Mr. Chandra eventually wrote up the actual document as you see it here.
Q. What is BGP Route Reflection? 11:56:34

A. BGP Route Reflection is a mechanism for taking routing information and reflecting it from one router to another through a third router. This allows for better scalability because it fixes the problem where BGP previously had where all BGP routers within a particular AS had to be directly interconnected. That led to some significant computational and configuration management challenges. 11:57:03
Q. Who came up with the phrase "Route Reflection"? 11:57:17
A. I believe, but I'm not certain, that that would be Mr. Haskin.
Q. And Mr. Haskin, to your recollection, worked for Bay Networks? 11:57:33
A. It may have been Wellfleet at the time.
Q. And just by implication from your answer, was Wellfleet acquired by Bay Networks?
A. Bay and -- I'm sorry.
Yes. Bay -- Bay was the merger of Synoptix and Wellfleet, and I believe he was on the Wellfleet side. 11:57:52
Q. And why do you think that Mr. Haskin came up with the phrase "Route Reflection"?
A. So I believe he was the first one at IDR 11:58:11

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were administered an oath; that a record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; that the foregoing transcript is a true record of the testimony given.

Further, that if the foregoing pertains to the original transcript of a deposition in a Federal Case, before completion of the proceedings, review of the transcript [X] was [ ] was not requested.

I further certify I am neither financially interested in the action nor a relative or employee of any attorney or any party to this action.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: February 3, 2016

Susan F. Magee

CSR No. 11661, RPR, CCRR, CLR

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

CISCO SYSTEMS, INC.,

Plaintiff,

vs. No. 5:14-cv-05344-BLF(PSG)

ARISTA NETWORKS, INC.,

Defendant.

_____/

CONFIDENTIAL PURSUANT TO THE PROTECTIVE ORDER

VIDEOTAPED DEPOSITION OF TONG LIU

FRIDAY, JANUARY 15, 2016

PALO ALTO, CALIFORNIA

Reported by:

ANDREA M. IGNACIO, CSR, RPR, CRR, CCRR, CLR

CSR LICENSE NO. 9830

JOB NO. 2211574

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

CISCO SYSTEMS, INC.,
Plaintiff,
vs. No. 5:14-cv-05344-BLF(PSG)
ARISTA NETWORKS, INC.,
Defendant.
_____/

Videotaped Deposition of Tong Liu, taken on Friday, January 15, 2016, pursuant to notice, on behalf of the Defendants, at 610 Page Mill Road, Palo Alto, California before me, ANDREA M. IGNACIO, CSR, RPR, CRR, CCRR, CLR ~ CSR License No. 9830

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WITNESS: Tong Liu

EXHIBITS

EXHIBITS (Continued.)

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PREVIOUSLY MARKED EXHIBITS

Exhibit 53 CLI Design and Review Guide, Bates CSI-ANI-00073381 - '.000014; 15 pgs.

PALO ALTO, CALIFORNIA
FRIDAY, JANUARY 15, 2016
9:32 A.M.

THE VIDEOGRAPHER: Good morning. We are on the record at 9:32 on January 15th of the year 2016. This is the video deposition of Tong Liu.

My name is Kevin Foor. I'm here with court reporter Andrea Ignacio. And we are here from Veritext Legal Solutions at the request of Keker & Van Nest.

This deposition is being held at Wilson Sonsini Goodrich & Rosati in Palo Alto.

The caption of the case is Cisco Systems, Inc., v. Arista Networks. That is case 514-CV-05344 ELF BSG.

Please note that audio and video recording will take place unless all parties agree to go off the record. Microphones are sensitive and may pick up whispers, private conversations, and cell interference.

I'm not related to any party in this action, nor am I interested financially in the outcome in any

way.

If there are any objections to proceeding, please state them at the time of your appearance.

And if you would please state your appearances.

MR. WONG: Ryan Wong from Keker & Van Nest for defendant Arista Networks.

MR. PAK: Sean Pak of Quinn Emanuel, representing Cisco and the witness.

THE VIDEOGRAPHER: Thank you.

If the court reporter would please swear the witness, we can begin.

TONG LIU,
having been sworn as a witness
by the Certified Shorthand Reporter,
testified as follows:

EXAMINATION

BY MR. WONG:

Q Good morning, Ms. Liu.
A Good morning.
Q Please state your full name for the record.
A Tong Liu.
Q Do you go by any other names, Ms. Liu?

A At work, I go with Toni.
Q Could you spell Toni for me, please.
A T-O-N-I.
Q Okay. Have you gone by Toni Liu for -- for what period of time have you gone by Toni Liu?
A That name is only used at work. It's not an officially alternative name.
Q And besides Toni Liu, have you gone by any other names, Ms. Liu?
A No.
Q Could you please state your home address.
A 1741 Pear Tree Lane, Mountain View.
Q And do you have any personal e-mail addresses that you use?
A Yes.
Q Could you please tell me what those are.
A tonieliu@yahoo.com.
Q Okay. Any other e-mail addresses?
A liu.toni@gmail.com.
Q Thank you.

Who is your current employer, Ms. Liu?

A Aruba Networks.
Q Do you have a work address for Aruba Networks?
A 1322 Crossman Avenue, Sunnyvale.

Q Do you have a work e-mail address for your job at Aruba?
A toniliu@arubanetworks.com.
Q Now, Ms. Liu, are you represented by counsel at this deposition?
A I'm represented by attorney Mr. Sean Pak.
Q Okay. And do you understand that you are testifying here today in response to a subpoena issued in this lawsuit?
A Yes.
Q Okay. Have you seen the subpoena issued in this lawsuit?
A Yes.
Q Did you see the document requests that accompanied the subpoena in this lawsuit?
A The document?
Q Requests for documents.
A Requests for documents?

Yes, I have seen that part.

Q And did you search for documents that fell within the categories within the subpoena?
A I looked around. I don't have any of those documents.
Q Ms. Liu, have you ever been deposed before?
A No. This is the first time.

starting in 2008."
Do you see that?
A Yes.
Q Did I read that correctly?
A Yes.
Q Is that referring to the implementation that you did, Ms. Liu?
A Yes. We were DSBU, and X-Men 2 was the internal release number we were using for --
Q Did you come up with X-Men 2?
A Do the --
Q Did you come up with the term X-Men 2?
A No.
They came up with X-Men 2. We were using it.
Q And what does DSBU stand for?
A Data switching business unit.
Q Okay.
A No, desktop switching. Sorry.
Q And was the IE 3000 platform -- is that the industrial Ethernet device that we've been talking about?
A Yes, it's the industrial Ethernet switch.
Q Okay. You can set that one aside.
A Okay.
Q Turning back to Exhibit 93, the -- the large

document in front of you.
A (Witness complies.)
Q You did not come up with the term PTP; correct?
A No.
Q The -- the acronym PTP was in use before you began implementing PTP functionality into Cisco's industrial Ethernet device; correct?
A You mean before we implement the protocol, no one was using PTP term in Cisco?
Q No.
I'm -- I'm just saying, the acronym PTP --
A Right.
Q -- was in use before you began implementing PTP functionality into Cisco's industrial Ethernet devices; correct?
A Yes, I -- yeah, the term exist --
Q Right.
A -- about the --
Q It -- it -- it was in the -- the document here marked as Exhibit --
A Yes.
Q -- 93; correct?
A Yes.
Q And, in fact, on page 7 of Exhibit 93 --

actually, are you on page 7?
A Yes.
Q At the bottom of page 7, there is a section 3.2 called "Acronyms and Abbreviations."
Do you see that?
A Right.
Q These are acronyms and abbreviations that are used in the PTP IEEE standard; correct?
A Yes.
Q And, on the following page, page 8, there is an acronym PTP there.
Do you see that?
A Yes.
Q It stands for precision time protocol?
A Yes.
Q So it was well known that PTP meant precision time protocol; correct?
MR. PAK: Objection; calls for speculation; assumes facts not in evidence; calls for expert testimony.
THE WITNESS: When you say "well known," is it -- what's the scope of well known?
MR. WONG: Q. It was well known by people in the networking industry, right --
MR. PAK: Same --

MR. WONG: Q. -- that PTP meant precision time protocol?
MR. PAK: Same objections.
THE WITNESS: I don't think it's well known in the entire networking industry.
MR. WONG: Okay.
Q Was there a subset of the networking industry where PTP was known to refer to the PTP in Exhibit 93?
MR. PAK: Objection; vague; calls for speculation; assumes facts not in evidence.
THE WITNESS: It's not as normal a term as IP or MAC. The -- the term is still -- I think even for people who are working on the Catalyst switches, it's not a very well-known term.
MR. WONG: Okay.
Q But certainly, the IEEE standard marked as Exhibit 93 defines the PTP acronym; correct?
A Yes.
Q And uses the PTP acronym --
A Yes.
Q -- to describe precision time protocol; correct?
A True.
Q And it uses that PTP acronym to describe the PTP functionality that you implemented in Cisco's

industrial Ethernet devices; right?
MR. PAK: Objection; assumes facts not in evidence; mischaracterizes the witness' prior testimony.
THE WITNESS: In this spec, yes.
MR. WONG: Q. Well, is PTP used in Cisco's industrial Ethernet device in a different way than what PTP means in Exhibit 93?
MR. PAK: Objection; vague.
MR. WONG: Let me rephrase the question.
Q In the five commands that you're associated with in Exhibit 92 --
A Right.
Q -- all of them use the acronym PTP; correct?
A Yes.
Q That PTP refers to the same PTP that is shown on page 8 of Exhibit 93; right?
MR. PAK: Objection; vague.
THE WITNESS: I think when I chose the command, yes, I used PTP to mean the same as precision time protocol --
MR. WONG: Right.
THE WITNESS: -- as in the spec.
MR. WONG: Q. As in the spec and, in fact, as in -- as on page 8 of Exhibit 93, correct, which

lists the PTP -- which lists PTP as an acronym; correct?
MR. PAK: Objection; vague.
THE WITNESS: I would say the meanings are the same, that they mean precision time protocol.
MR. WONG: Q. Well, the -- the words are the same, too; correct?
PTP in the command is the same three letters that appear on page 8 of Exhibit 93; correct?
A It's the same acronym.
Q And they're referring to the same protocol; correct?
A Yes.
Q Now, if you'll turn to page 4 of Exhibit 93.
A (Witness complies.) Okay.
Q You can take off the -- well --
A This is --
Q -- maybe you want to keep that together, actually.
A Right.
Q On page 4 of Exhibit 93, there is a large heading No. 3 entitled:
"Definitions, acronyms, and abbreviations."
Do you see that?
A Yes.

Q And then subsection 3.1 says "Definitions."
Do you see that?
A Yes.
Q Definition 3.1.4 in the IEEE PTP specification defines the term "clock."
Do you see that?
A Yes, uh-huh.
Q What is the definition of clock in the IEEE standard?
A It's no participating in the precision time protocol, PTP, that is capable of providing a measurement of the passage of time since a defined epoch.
Q And you have read these definitions before you began developing the PTP functionality in Cisco's industrial Ethernet devices; right?
A Yes.
Q So you were familiar with these IEEE defined terms before you began working on the PTP functionality; correct?
A Yes.
Q And you knew they were in the IEEE standard; correct?
A Yes.
Q Okay. Now, the definition of clock that you

read, is that your understanding of what a clock is in the context of PTP?
MR. PAK: Objection; vague.
THE WITNESS: So, in the context of PTP standard or spec, yes, a clock means this.
MR. WONG: Q. A clock means what it says on page 4 of --
A Yes.
Q -- Exhibit 93?
A Right.
Q And you -- you -- you did not come up with the term clock in the context of PTP; correct?
A No.
Q All right.
Clock is just a defined term in the IEEE standard marked as Exhibit 93; correct?
A Yes.
Q Okay. If you'll look at page 6 of Exhibit 93.
A (Witness complies.) Right.
Q Term 3.1.23; do you see that?
It defines the term "parent clock" correct?
A Yes.
Q What's the definition of parent clock?
A The master clock to which a clock is

synchronized.
Q And is that your understanding of what a parent clock is in the context of PTP?
A It is.
Q And you get that understanding from the IEEE standard marked as Exhibit 93; correct?
A Yes.
Q All right.
You don't disagree with that definition; correct?
A No.
Q And you don't disagree with the definition of clock in the IEEE PTP standard; right?
A No, I don't.
Q Okay. Now, the term parent also refers to the parent clock in a PTP context; correct?
A The term parent --
MR. PAK: Objection; vague.
THE WITNESS: -- in this document --
MR. WONG: Yes.
THE WITNESS: -- whenever -- yeah, a parent clock is used, it means the definition here.
MR. WONG: Sure.
THE WITNESS: Is that the question?
MR. WONG: Sure.

Q If you'd turn to page 53 of Exhibit 93. Let me know when you're there.
A 53?
Q The ending control number for that is '31805.
A (Witness complies.) Yeah, I found it.
Q Okay. If you look above -- so, near the bottom of the page, you see in bold:
"7.6.2 PTP Device Attributes."
Do you see that?
A Yes.
Q Okay. Right above that, there are -- there are two sort of indented bullet points, I guess, or dashes.
Do you see that?
A (Witness nods head.)
Q And then, right above that is a sentence that begins with the words "ordinary and boundary clocks."
Do you see that?
A Ordinary and boundary clocks.
Q Yep.
A Okay.
Q So that full sentence says:
"Ordinary and boundary clocks may keep statistics on the performance of their parents using the following attributes."

Do you see that?
A I haven't found that sentence.
Oh, yeah, found it.
Q Okay. That sentence in the IEEE standard uses the term parents; do you see that?
A Yes.
Q Is it your understanding that -- that that parents term refers to a parent clock?
MR. PAK: If you need to take some time to look at the document more closely, you can do that.
THE WITNESS: Yes.
MR. PAK: Okay.
THE WITNESS: I think it -- it's referring to the parent clock.
MR. WONG: Right.
Q There's no ambiguity in the context of the IEEE standard that parent refers to parent clock; right?
A Yes. Here, it means -- yeah, it does mean parent clock.
Q Okay. So, in the context of the PTP standard, referring to the parent of a clock is referring to the defined term parent clock that we discussed a few minutes ago; correct?
A Yes.

Q Okay. Now, if you look on that same page, underneath the heading "PTP Device Attributes," you see the term "Priority 1"?
A Yes.
Q What is a PTP device attribute?
A It's certain characteristics of a PTP clock.
Q That are defined by the IEEE standard; correct?
A Yes, uh-huh.
Q Okay. And these are device attributes that are mandatory to be supported to comply with the PTP standard; correct?
MR. PAK: Objection; calls for expert testimony.
MR. WONG: Q. If you know.
A I didn't see anything as mandatory here.
Q Okay. If you read the description of priority 1, it says:
"The attribute priority 1 is used in the execution of the best master clock algorithm; see 9.3.2. Lower values take precedence. The initialization value of priority 1 is specified in a PTP profile. The value of priority 1 shall be configurable to any value in the range 0 to 255, unless restricted by limits established by an

applicable PTP protocol" -- I'm sorry -- "PTP profile."
Did I read that correctly?
A Yes.
Q Okay. Now, the -- the definition says the value of priority 1 shall be configurable.
Do you see that?
A Yes.
Q "Shall" is a mandatory term in the IEEE standard; correct?
MR. PAK: Same objection; calls for expert testimony.
THE WITNESS: Would you please rephrase that question.
MR. WONG: Sure.
Q "Shall" is a mandatory term -- strike that.
"Shall" indicates a mandatory requirement in the IEEE standard; correct?
MR. PAK: Objection; calls for expert testimony.
MR. WONG: Q. And it may help --
A I can say only my understanding, that it's recommending that priority 1 is an attribute, that this is a configurable value.
Q If you'd turn to page 9 of the same document,

Exhibit 93.
A (Witness complies.) Okay.
Q And you see right in the middle of the page, it says "word usage"; correct?
A Uh-huh, I see.
Q And it defines "shall" in 4.2.1.
Do you see that?
A Yes.
Q And this is -- and you -- you read the entire standard before you implemented any of the functionality with Cisco's products; right?
A Yes.
Q The definition of "shall" -- well, why don't you please read the definition of "shall."
A "The word 'shall,' which is equivalent to 'is required to,' is used to indicate mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted."
Q Okay. And you understood that when you read the standard; correct?
A Yes.
Q Okay. If you'd turn back to page 53 that we were just on.
A (Witness complies.) Right.

Q So, it is a -- it is a requirement to comply with the standard for there to be a value of priority 1 that is configurable as described here on page 53; correct?
A Yes.
MR. PAK: Same -- and again same objection; calls for expert testimony.
MR. WONG: Q. If you'd turn -- I'm sorry.
And -- and do you have any disagreements with the description of priority 1 here on page 53?
A No.
Q Okay. If you'd turn to the next page in Exhibit 93.
A (Witness complies.)
Q At the top, it has another attribute, "priority 2."
Do you see that?
A Yes.
Q And the definition of priority 2 also has a sentence that says:
"The value of priority 2 shall be configurable to any value in the range 0 to 255, unless restricted by limits established by an applicable PTP profile."
Do you see that?

A Uh-huh, yes.
Q So the value of priority 2 -- strike that.
So it's a requirement to comply with the PTP standard for the value of priority 2 to be configurable as described here on page 54; correct?
MR. PAK: Same objection; calls for expert testimony.
THE WITNESS: Yes, it's a parameter.
MR. WONG: Right.
THE WITNESS: Right.
Q And that's your understanding, based upon the standard's own definition of what "shall" means within the document; correct?
A Yes.
Q Okay. And when you implemented the PTP functionality in Cisco's devices, was it your intention to comply with the standard -- with the IEEE standard marked as Exhibit 93?
MR. PAK: Objection; vague.
THE WITNESS: Again, there were certain multiple aspects of it; right?
MR. WONG: Q. But, with respect to the two device attributes that we just discussed, was it your intention to comply with the IEEE standard?
MR. PAK: Same objection; vague.

THE WITNESS: I think we intended to make these two parameters as configurable for PTP clock. So, for that part, yes, the compliance is that we shall make these as configurable values.
MR. WONG: Q. As required by the IEEE standard marked as --
A Yes.
Q -- Exhibit 93; correct?
A Yes.
Q Is it possible to have vendor interoperability for PTP if you don't comply with the PTP standard?
MR. PAK: Objection; calls for expert testimony; vague.
MR. WONG: Q. In your view?
MR. PAK: Same objections.
THE WITNESS: In my view, the basic external behaviors needs to be consistent to be interoperable.
MR. WONG: Q. And are the device attributes that we just discussed, priority 1 and priority 2, are those part of those external behaviors that need to be consistent in order to support interoperability?
MR. PAK: Same objection; vague.
THE WITNESS: I think the priority value being configurable, changeable by users is -- as you

said, as required -- it's required to be interoperable --
MR. WONG: Okay.
THE WITNESS: -- at the PlugFest.
MR. WONG: Q. So, to comply with the PTP standard, there have to be configurable device attributes called priority 1 and priority 2 as described on pages 53 and 54 of Exhibit 93?
MR. PAK: Objection; calls for expert testimony. Objection; vague.
THE WITNESS: My understanding is these two parameters, which needs to be configurable.
MR. WONG: Okay.
Q To comply with the PTP standard?
A Yes.
Q Okay. If you'd turn to page 62 of that same document, Exhibit 93. Let me know when you're there.
A (Witness complies.) Yes, I'm on page 63.
Q 62. I'm sorry.
A 62. (Witness complies.) Okay.
Q Okay. About two-thirds down on that page 62, there is a subheading 7.7.2.3.
Do you see that?
A Yes.
Q And the text next to that is:

"Sync (multicast) message transmission interval."
Do you see that?
A Yes.
Q Now, the sentence below that says:
"The port DS.log sync interval shall specify the mean time interval between successive sync messages, i.e., the sync interval, when transmitted as multicast messages."
Do you see that?
A Yes.
Q Did I read that correctly?
A Yes.
Q So the -- and that sentence, by the way, uses the word "shall" again; correct?
A Yes.
Q That indicates that this is a required -- a requirement of the PTP standard; correct?
MR. PAK: Objection; calls for expert testimony.
THE WITNESS: I -- my understanding is this is to be supported to implement a PTP protocol.
MR. WONG: Q. And that understanding is based upon the definition of "shall" provided on page 9 of the standard; correct?

A Yes, uh-huh.
Q That definition of "shall" says that no deviation is permitted; correct?
If you need to look at page 9, you can confirm that.
A Right. No deviation of the behavior, I guess.
Q Okay.
A Right.
Q Is that your understanding?
A Right.
Q So turning -- so you're still on page 62. The IEEE standard uses the term "sync interval" to describe the mean time interval between successive sync messages; correct?
A Sync interval as specified in the text here?
Q Yes.
A Right. Yes.
Q So, do you agree that the IEEE standard marked as Exhibit 93 on page 62 defines the sync interval as the mean time interval between successive sync messages when transmitted as multicast messages?
A Yes.
Q Okay. Do you have any disagreements with that definition?

correct?
A Yes.
Q And if you'll look briefly at Exhibit 96.
Let me know when you're there.
A Yes.
Q Under "interface level config commands,"
listed there is "PTP sync-interval" with a hyphen.
Do you see that?
A PTP sync-interval, yes.
Q With a hyphen --
A With a hyphen.
Q -- between sync and interval?
A Right.
Q Did you remove the hyphen based upon
Mr. Woodman's directive?
A Yes, I believe that should be true.
Q And the purpose of removing the hyphen, as
described in Mr. Woodman's e-mail marked as
Exhibit 97, was to take advantage of the auto complete
functionality; correct?
MR. PAK: Objection; mischaracterizes the
witness' testimony; incomplete.
THE WITNESS: I would say both auto
completion and hierarchy as --
MR. WONG: Q. What -- go ahead.

A You go ahead first.
Q What -- in your mind, what is the difference
between auto completion functionality and hierarchy?
A Hierarchy -- let's say there is PTP sync
interval, PTP sync limit. So, when we type PTP,
space, sync, and then question mark, that gives you
the next level of that command, which is interval. So
this is the hierarchy part, which won't be there if
there is a hyphen. So, all of them would be under
PTP, and you have all of the options.
Q Did you come up with the idea to have a
hierarchy for these PTP commands?
MR. PAK: Objection; vague.
THE WITNESS: Meaning -- can you rephrase
that. Did I come up with the concept?
MR. WONG: You just described the concept of
a hierarchy.
Q Was that concept -- did that concept
originate from you?
MR. PAK: Objection; vague.
THE WITNESS: A lot of Cisco CLI commands
has -- have hierarchies. That part I knew even before
I developed these commands.
MR. WONG: Okay.
Q So the organization of Cisco commands in a

hierarchy existed before you started adding PTP
commands to the software?
A Yes.
Q And you were aware of that?
A I'm -- yeah, I was aware of that.
Q Right.
And so you modeled -- you modeled your
commands based upon the hierarchy concept that already
existed in Cisco software?
MR. PAK: Objection; vague.
THE WITNESS: I think I was thinking it would
be good to have that part for these CLI commands.
MR. WONG: Okay. Okay.
I think it's a good time to take a break.
THE VIDEOGRAPHER: It is 1:01.
We are going off the record.
Please don't forget your mics.
(Lunch break taken at 1:01 p.m.)
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AFTERNOON SESSION
1:41 P.M.

THE VIDEOGRAPHER: We are back on the record.
It is 1:41.
MR. WONG: Q. So, Ms. Liu, before the lunch
break, we talked about the five commands that are
associated with you in Exhibit 92.
A Yes.
Q One of the commands is "PTP priority 1."
A Yes.
Q Do you see that?
A Uh-huh.
Q What is the function that the "PTP
priority 1" command performs?
A It configures the priority 1 parameter for
the PTP clock.
Q Okay. And when you say "for the PTP clock,"
you mean PTP as defined by the IEEE standard; right?
A Yes.
Q You're not talking about a different PTP
that's separate from the IEEE standard; right?
A No.